GEOGRAPHIC SCHOOL BULLETINS

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SELF-RULE IN AFRICA— Beauty-scarred voter wears registration in her turban UPI

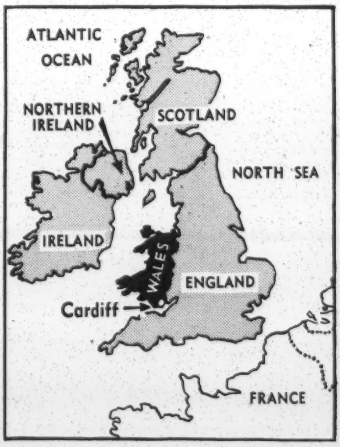
Also— WALES, PRAIRIE DOGS, ASTEROIDS

UMI

well over 1,500 years ago, survived the Roman occupation of some 350 years, picking up only a few Latin words from the conquerors.

Wales was already old when the Romans arrived during the first century A.D. Flints that Stone Age man used in shooting his meat have been found in cave dwellings throughout the country.

Today's coal-digging Welshman traces his ancestry back to a Mediterranean seafaring people—short, dark Iberians—who settled in Wales 2,000 years before Christ. Waves of tall blond Celts from the plains of northern Europe followed, conquered the Iberians, and introduced sheep rearing. They dotted the countryside with hill forts, many of them well developed structures of stone that remain standing today. A later wave brought the language that Caesar heard. It is used among the shepherds on the bleak moors and mountains today.



GSB MAP

After the Romans pulled out in 409, leaving behind Christianity, the Welsh remained unconquered for 700 years. Chaos reigned as the hill tribes fought each other and raided the English across the border. Then after intermittent battling with the English, the Welshmen were conquered and Wales was made a principality of its neighbor in 1536. The heir to the British throne is the Prince of Wales.

But the Welsh refused to be Anglicized. Yesterday and today the Welshman has guarded his individuality. He stands aloof from foreigners. When the Normans conquered Britain in 1071, and pushed west into Wales, the Welshmen borrowed few French customs.

The Welsh cling to old ways as long as they can. Today, although the custom is dying, grandmother may still come to market in her traditional stovepipe hat and shawl, a survival of the 17th century. The Welsh national costume, now worn by the young on gala occasions, is modeled at left during an international music festival in Llangollen.

Two Welshmen, the saying goes, make a choral society. The Welsh have a great love of music, especially singing. Families

UMI

GRACE ROBERTSON, PIX; BRITISH INFORMATION SERVICES, BELOW

WALES: The Green and the Black

MEN, DOGS, AND SHEEP trudge to the shearing pen one step ahead of the melancholy mist veiling the mountains. These are Welsh constants: rolling mountains, grazing sheep, and rugged men.

Wales also lurks in verdant coastal lowlands where dairy farmers churn butter, and on sandy ocean beaches flanked by resort hotels. It sings sweet on the northern island of Anglesey abloom with wheat, oats, and barley; it shouts harsh from the slag piles and coal mines of the south. Steel mills that light up the night sky are as Welsh as green valleys yet untouched by industry.

But it is the mountains, often castle-crowned, that have always set Wales apart: lonely mountains lashed by Atlantic gales and soaked by rain, rich in scenery, sparsely peopled, difficult for farming, discouraging to road builders, but irresistible to travelers. Because of the mountains, it is easier to journey between north and south Wales by going into England, but few tourists bitten by the Welsh bug would consider it.

Smaller than New Jersey, Wales has remained distinct from adjoining England (see map below) largely because of its mountains.

In Cardiff, the cosmopolitan capital, and in the southern industrialized towns, one may not hear much Welsh spoken. But in the snug grey stone farmhouses of the uplands, Welsh is the native tongue. It is a language stingy with vowels and overburdened with consonants, a language that includes the tongue-twisting town name: Llanfairpwllgwyngyllgogerychwyrndrobwllllandysiliogogogoch—"the-church-of-St. Mary-on-the-pool-of-the-white-hazel-by-the-raging-whirlpool-near-the-church-of-St. Tysilio-of-the-Red-Cave." Welsh is the language of early schooling and prayer, of the public meeting, of some weekly newspapers, and some television programs of the BBC's Welsh station. The Welsh pride themselves that their language, written

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WALES HOLDS A 'WORLD SERIES' OF SONG AND POETRY

ROBED MEN WITH BRONZE oak-leaf crowns move in stately procession.

Druids of pre-Roman Wales assembling in a murmuring forest to begin a religious rite? Not at all. It's a National Eisteddfod in present-day Wales. Its rulers, the Gorsedd, perform fanciful Druidic rites.

The eisteddfod is a national institution as exciting to a Welshman as is the World Series to an American. For a week competitions ranging from brass bands to drama to verse-writing are held. The plays are in Welsh, there are exhibits of Welsh folk art, and above all, there is plenty of the Welsh favorite—singing.

Held every year—alternately in north and south Wales—the National Eisteddfod includes the Crowning of the Bard: amid cheers the winner of the verse competition is robed in a purple gown and crowned with oak leaves.

The National is not the only eisteddfod held in Wales. Smaller ones are held all over the country in villages, towns, and counties. Every July, Wales plays host to the International Musical Eisteddfod. Singers, dancers, players, and performers come from around the world to compete.

The modern eisteddfod grew from small beginnings. The bard was once a singing poet who roamed the country, carrying to the isolated homes not only entertainment but the news of the world. Ranging the sparsely populated hills and moors, he served to unite the scattered Welshmen.

However, Queen Elizabeth I became concerned that loafers were cashing in on the bard's profession. In 1568 she issued a Royal Commission for holding an eisteddfod to put the fakers to the test, and today's festival was born.

BRITISH INFORMATION SERVICES; E. J. BROWN, BELOW

gather around pianos in the evening. A harpist and a singer perform a duet. A miners' chorus rehearses for a concert. Almost every village can produce a well-trained choir. Most counties put on their own music festivals.

On the mountain farms, it is a long way between neighbors, and the Welsh are devoted family people. They are frugal, too. About one-third of Wales lies 1,000 feet or more above sea level, and even on lower land, brown rocks push through the thin soil. Making a living is hard.

Welshmen love their scanty soil. Those who work the coal pits dream of farms in the highlands. Welshmen around the world dream not of collieries but of farmhouses nestled against the heathered hills, the outbuildings joined to the home to form one long structure.

Today's rural Welshman herds sheep on the hillsides. Lowlands support dairies and mixed farms. Social life centers around trips to market, fairs, auctions, and chapel.

The farmer is slow to take on new tools. Welshmen have often refused the modern ploughs offered them. They shear sheep with hand clippers as their grandfathers did. Always farming has been guided at least partially by superstition. As late as the last century, a farmer prayed daily:

"From witches and wuzzards,
And long-tailed buzzards,
And all them things that get through
other men's hedges,
Good Lord deliver us all."

Before the industrial revolution, Welsh economy was based almost entirely on farming. Then came the steam engine, and the demand for coal to make it go.

Young men came down from the sweet air of the hills to dig in the pits, until, at the end of the 19th century, nearly half the population of Wales had migrated south to Glamorganshire and Monmouthshire, where the coal fields lie.

The green valleys of southern Wales changed almost overnight to vales of collieries and slag piles, sky-blackening iron and steel mills, copper smelters, chemical works, and oil refineries.

Today, nearly 3,000,000 people live in Wales, half of them in Glamorganshire. Factories, an old pit, and the rows of workers' terraced houses blanket the no-longer-green Rhondda valley, above. Here in the large towns, the old Wales is far away. The produce of the factories flows to England, and English becomes the common language of the coal fields and thus of newspapers and schools. L.B.

with cattlemen who wanted the grass for their own critters, and didn't appreciate their stock breaking legs by stepping into the dogs' burrows. They well nigh exterminated prairie dogs with poison bait and gases.

At the turn of the century, one "dog town" in Texas covered 25,000 square miles, and was home to perhaps 400,000,000 of the rodents. Now, the best place to find a colony is in a national park or monument, where they are protected.

The prairie dog's home is efficiently designed for his purposes. A yearling starting his own suburb begins by digging out a tunnel 5 to 15 feet deep. At the bottom, he branches off and digs parallel to the ground, perhaps adding side tunnels for nests as he goes. For protection against intruders, he then tunnels up until he is almost at the surface again. In time of danger he can sit here, and, if threatened from below by a badger or ferret can dig his way out. This upper chamber also acts as an air lock—if heavy rain covers the plain with water, it may pour down his tunnel, but the air in the escape hatch holds it back while the prairie dog sits dry and snug.

Foraging rodents have a series of signals to help them escape from hungry animals or birds that would eat them. A shrill bark warns of the approach of danger. When a prairie dog hears the alarm, he rushes to the entrance of his burrow, ready to disappear.

One observer saw a prairie dog that barked "wolf" too often. An old female yipped at everything from rabbits to large grasshoppers. The others, familiar with her nervous ways, paid no attention.

Another, higher-pitched bark signals "hawk!" and sends the whole town underground instantly (below). Close to the mouth of the burrow is a ledge where the prairie dog can sit in safety and tell the predator what he thinks of him. F.S.

WARREN E. GARST, WALT DISNEY PRODUCTIONS

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Prairie Dog

I am not *either* a dog! I'm a happy suburbanite, owner of a split-level house, with a large family and lots of friends, even if the cattlemen don't like me.

NATIONAL GEOGRAPHIC PHOTOGRAPHER BATES LITTLEHALES

THE MISNAMED and much-abused landowner above looks over the neighborhood from his front porch.

He is a prairie dog, a name he has never been able to live down although he is no more a dog than he is a cow. He is a rodent, like squirrels and rabbits. Early explorers of the Great Plains named him for a barklike call, and the name stuck.

A chatty, friendly little beast, the prairie dog likes to live among his friends and family. If two meet while going about the chores, they don't just gossip across the backyard, they kiss, touching their big front teeth, rub each other a little, then, perhaps, set off side by side toward the grocery—in this case, clumps of tender grass.

But if a stranger invades the turf, there's a rumble. Any prairie dog crossing the line that separates one neighborhood from another is greeted with a ruckus, and scolded back where he came from.

A fastidious eater, the prairie dog enjoys the grasses and plants of the plains, snipping them off neatly at the base, and then nibbling the lower portion of the stalk (left). This habit got it in bad

wanderers reach even closer. One passes between the sun and Mercury, the closest planet.

Geographos

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found in the next year by a scientist who was searching for Ceres.

Just by looking carefully, astronomers found 322 asteroids by 1891. Then photography was employed, and hundreds are now found on photographic plates each year—often by astronomers working on other problems.

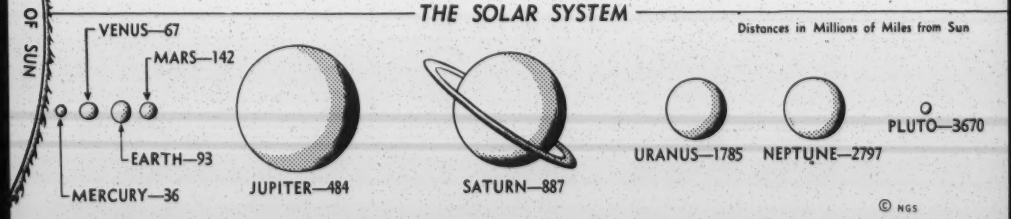
So many have now been spotted that it is a major problem to keep track of them and be sure that a new discovery is not simply a familiar asteroid whirling back after an absence. A central clearing house of information has been set up at Cincinnati University Observatory. Reports come in from around the world.

By measuring the light reflected by asteroids, astronomers have discovered that many of them are not round as are the major planets. Instead, they are irregular and rough, perhaps with sharp edges. This tends to support the theory that they were created by the breakup of a larger planet. (Although the total mass of all the asteroids put together would equal only a thousandth of Earth's volume, making the original planet a small one indeed.)

Other theories on the origin of the asteroids hold that (1) they were formed from material which in the beginning of the solar system was unable for some reason to condense into one large planet, or (2) they are parts of ancient comets. F.S.

Skywatchers Can See 4 Planets

FOLLOWERS of the School Bulletins series on the solar system may be interested in a spectacular event now visible in the sky. During late January and early February, four planets can be seen in a group with the naked eye. An observer in the United States should look to the east-south-east shortly before dawn. In the constellation of Sagittarius there will be visible Venus, Mars, Jupiter, and Saturn. Detailed sky charts for each month are shown on the National Geographic's "Map of the Heavens," $1.



MEDIEVAL ASTRONOMERS, trying to establish order in the universe, were convinced that some planet should be found between Mars and Jupiter. Working backward from what they knew about the locations of planets, they figured this way:

If you take a series of numbers starting 0, 3, 6, and continue to double the number each time, you arrive at a series: 0, 3, 6, 12, 24, 48, 96, 192, etc. Then, by adding 4 to each of the numbers, the series reads:

4, 7, 10, 16, 28, 52, 100, 196, etc.

These numbers express very closely the distances between the sun and the various planets. Mercury 4, Venus 7, Earth 10, and so on.

This satisfying scheme, known as Bode's Law, seemed to receive further confirmation in 1781 when Uranus was discovered, lying at about 192, which is very close to the 196 figure of the series.

The disturbing thing in this orderly arrangement was that there was no planet at all in the position 28, between Mars and Jupiter. A diligent search for one was made. While it continued, the first asteroid was found by accident where Bode's Law called for a planet. Later discoveries have thrown considerable doubt on the "law," but it certainly proved useful to earlier astronomers.

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The Solar System, No. 5

ASTEROIDS

MOUNT WILSON AND PALOMAR OBSERVATORIES

STUDYING A STAR-SPANGLED photograph, two astronomers in 1951 noticed a bright streak where none was supposed to be (lower right in the picture above). No star made it, for the telescope that took the picture had moved as the stars moved, recording each as a dot of light. The streak might have been caused by a planet—except no planet was there to cause it.

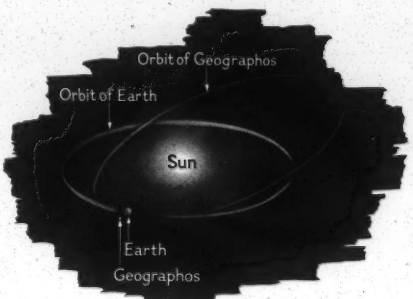
Examination proved the heavenly dash to be the track of an asteroid, or baby planet, one of the enigmas of the solar system.

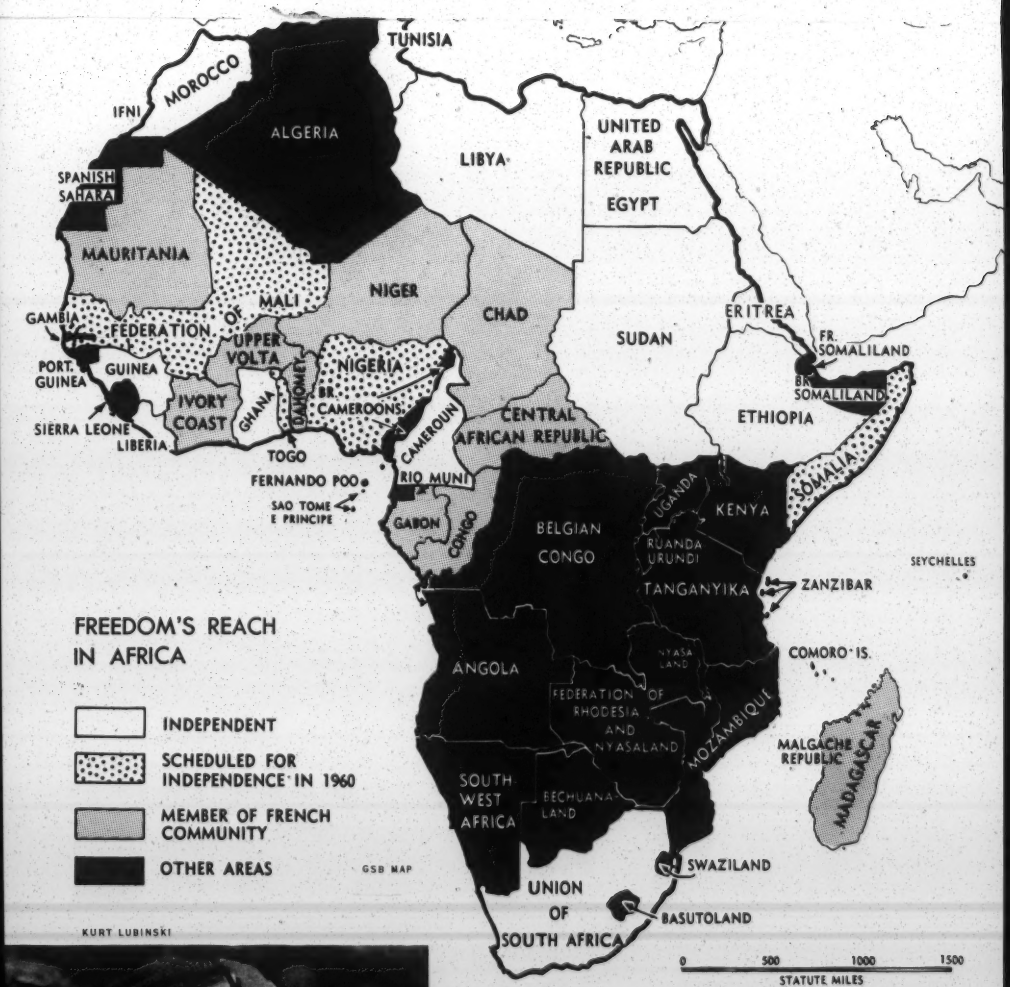
Thousands of these small bodies whirl in space, mostly between the orbits of Mars and Jupiter. No one knows for sure where they come from, the most accepted theory being that they are fragments of a lost planet that broke into bits through some celestial catastrophe.

The discoverers named this particular flying rock *Geographos*, in honor of the National Geographic Society, which sponsored their work as part of the National Geographic-Palomar Observatory Sky Survey. They calculate that Geographos is about a mile wide. Its orbit, as drawn at right, comes closer to the sun than Earth's does. Other asteroid wanderers reach even closer. One passes between the sun and Mercury, the closest

Although Geographos comes nearer the earth than any other known asteroid, others have hit the earth and moon in the past. The craters on the moon could have been caused by collision with asteroids. Recently, scientists identified a vast jumble of smashed rock in west Texas as the debris of an earth-asteroid smashup some 50 million years ago.

Even before any of the asteroids were found, some astronomers believed there must be something between Mars and Jupiter. As you can see from the diagram below, there seems to be a gap in the orderly sequence out from the sun. While they searched for this "missing" planet, a Sicilian, G. Piazzi, on the first night of the 19th century, discovered the first and largest asteroid, Ceres, 500 miles in diameter. A second, Pallas, was





Before World War II, Liberia (an American creation for freed slaves), Ethiopia, and the Union of South Africa were the only independent countries. Since, Morocco, Tunisia, and Guinea have won freedom from France. Eritrea joined Ethiopia. Libya was cut off from Italy. Egypt, nominally independent before the War, cast off all British influence.

In 1958 French West Africa became the republics of Mauritania, Senegal, Soudan, Ivory Coast, Upper Volta, Dahomey, Niger, and the new nation of Guinea. Four other states—Chad, Gabon, Congo, and the Central African Republic—replace French Equatorial Africa. Madagascar, fourth largest island in the world, is the Malgache Republic. Except Guinea—which chose complete sovereignty and joined the United Nations—these new states are

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CAMERA PRESS-PIX

Independence! 1960 CLIMAXES AFRICA'S MARCH

The faster Africa moves from the dark past the more magic its drums proclaim. Not black magic, but the miracle of self-rule for lands long governed by outsiders.

Nineteen-sixty is a crescendo year for the independence drums. Five colonies will become nations, adding 50,000,000 free men to the continent's total. When the year ends, more than half of all Africans will live in independent countries—150,000,000 out of 230,000,000.

The 1960 drums of freedom have already sounded for Cameroun. Now dusky hands are poised to beat out declarations of independence for Nigeria, Somalia, Togo, and Mali. Soon the Nigerian lads above and the Togo chief below will know the privileges and responsibilities of citizenship enjoyed by schoolboys in England or town councilmen in Ohio. The Nigerian on the cover is exercising the highest right of freedom—casting a secret ballot in a free election.

Furthermore, the drums will not become silent after 1960. Africa, a stirring giant of chilly plateaus, blue lakes, snow-clad mountains, steaming jungles, humid coasts, hot sands, and broad grasslands, is barely rubbing the sleep from its eyes.

Along the Mediterranean, Algerian nationalists have been fighting for independence from France for more than five years. During Belgian King Baudouin's recent visit to the Congo, cheers of "Long live the King!" were drowned by jeers of "Independence! Immediate Independence!" In the British protectorate of Uganda, a committee appointed by the governor recommended greater African participation in the government. In Tanganyika, administered by the British, internal self-government has been promised for next September; complete independence will follow.

The drums echo through all Africa. Colonial empires shatter. Between them, Britain and France once held three-fourths of Africa, a continent triple the size of the United States. Belgium, Portugal, Spain, Germany, and Italy controlled smaller areas. Germany and Italy lost their shares after the two World Wars.

U.S. ARMY AIR TRANSPORT COMMAND; KURT LUBINSKI, BELOW

members of the French Community with internal self-government. Soudan and Senegal united as the Federation of Mali, whose capital, Dakar, is shown above. They have been promised independence this year.

Cameroun, mandated to France after World War I, became independent on New Year's Day. Togo gets freedom from France April 27. Somalia, formerly Italian Somaliland, becomes independent July 1. Nigeria, Britain's most populous remaining colony, gains complete independence October 1.

White man's rule in Africa, which began in the 1870's, may well be over by the 1970's, except possibly in the Union of South Africa, the Rhodesias, and Kenya, where white settlement has been in sufficient numbers to maintain local control.

What sort of nations will these new ones, and those that follow, become?

African potential staggers the imagination. Every crop under the sun grows on African land. Every major mineral waits beneath its crust. Enough water power to light the world gushes through its rivers and streams.

While Africa's resources have been tapped, growth is slow. Communications are primitive; transportation undeveloped. Disease ravages people short of medical care. There is little money for railroads, dams, and factories to make the continent prosperous. Illiteracy runs to 80 or 90 per cent. Native administrators who can take over the new governments are few.

Except for his burning desire for freedom and dislike for colonialism, the turbaned man from Dakar (left) has little in common with the Congolese fisherman. Africa is divided by 700 languages and dialects, many different customs and civilizations.

For the future, this seething continent is a question mark. Will Africa continue to attract Western assistance toward peaceful prosperity, or will dissension and poverty open doors for Communism? Or will new governments succeed in staying aloof from both? L.B.

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